



**US Army Corps  
of Engineers**

Waterways Experiment  
Station

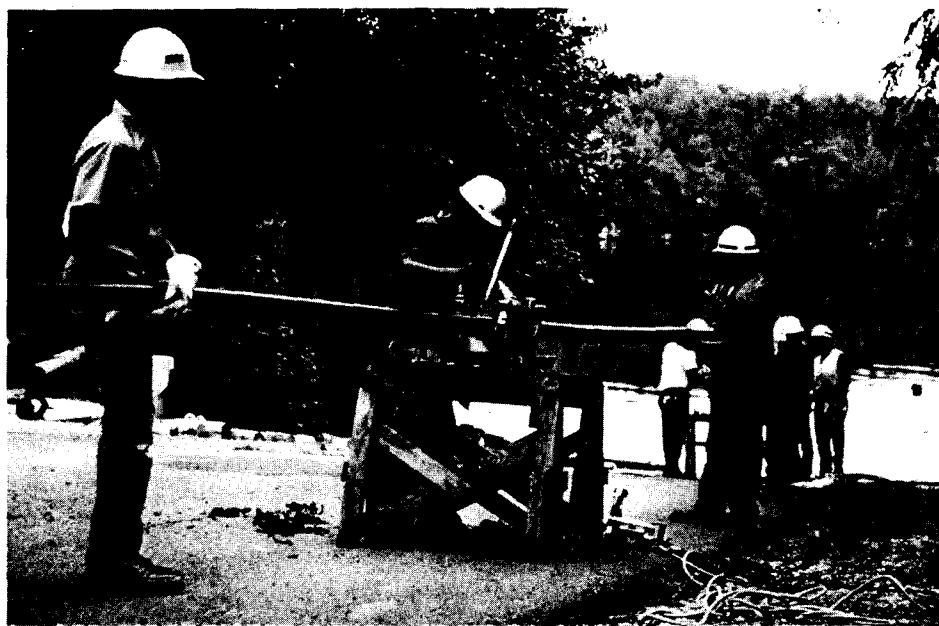
# RECNOTES

NATURAL  
RESOURCES  
RESEARCH  
PROGRAM

VOL R-90-1

INFORMATION EXCHANGE BULLETIN

MAR 1990



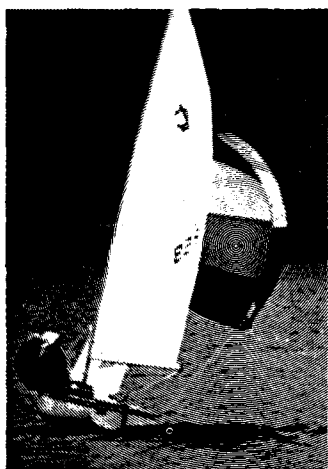
Workmen fusing pipe joints together, attaching anchors, and floating waterline into lake

## Providing Potable Water to Recreation Areas — A Nonconventional Alternative

*Daniel K. Hensley  
Assistant Resource Manager  
Black Warrior and Tombigbee Lakes*

At Deerlick Creek Park on Holt Lake an obstacle to campground renovation has been supplying adequate drinking water. Eight wells were drilled in the park during initial construction of recreation facilities in 1968. All but one of the wells yielded 1-1/2 gallons per minute (gpm) or less, the exception yielding 3 gpm. The water produced by the wells has a high iron content which requires treatment before use.

As renovation plans for the park were finalized, a final effort to find sufficient ground water in the park was made by drilling two additional wells and testing the yield on the most productive well drilled in 1968. One of the new wells was dry; the other yielded 1/2 gpm. The yield test on the 1968 well indicated that water yield had decreased.



Attention then shifted to a geologically different area located three miles from the park. Several private wells were producing water that would be sufficient for the needs of the park, but landowners in the area were not receptive to leasing a well site. Construction of a well, well house, equipment, and water supply line from the private property would be expensive, roughly \$120,000 estimated.

Options for supplying water to the park were narrowing. Municipal water, located seven miles from the park, would cost \$180,000 to extend into the park. Surface water treatment from Holt Lake would be costly and require manpower for operation and maintenance. The staffs from Black Warrior and Tombigbee Lakes and the Sanitary, Water Supply, and Environmental Engineering Section of the Engineering Division in the Mobile District began considering supplying water from a municipal system located on the opposite side of Holt Lake.

After researching the idea of installing a waterline across the bottom of Holt Lake, the Engineering Division offered a proposed plan. Those involved committed themselves to the project and preparations began.

Time was short because in about 10 weeks, Holt Lock, located 1 mile downstream of the lake crossing site, was scheduled to be closed for one week of maintenance. Plans were made to place the waterline across the bottom of Holt Lake during this week to eliminate interference with commercial navigation. The Corps of Engineers workboat ROS from the Tuscaloosa Area Engineer's Office would also be available to assist with waterline construction during the week of the lock closure.

Procurement of materials and a utility contract with the municipal water system were expedited to meet the schedule. Engineering design was completed by the Engineering Division and the waterline was laid from the municipal system to the lake shoreline by project maintenance personnel prior to the time for the lake crossing.

Crossing the lake with the waterline began as scheduled during the week of the lock closure. The project required anchoring a 3-inch, high-strength, polyethylene (PE) pipe across 2,000 feet of water at depths to 74 feet. PE was selected because it is light and flexible and sections of the pipe can be joined together by heat fusion. In this joining method both ends of the pipe are heated and then pressed together. As the plastic flows together from both ends and cools, the pipe becomes a unified piece and essentially contains no joints.



**Boats holding waterline in position while divers cut buoys loose and guide waterline into position on lake bottom**

The 40-foot lengths of pipe were fused on the shoreline. Anchors weighing 55 pounds each were attached at intervals ranging from 6 to 12 feet depending on the depth of water at locations the pipe would lay. Each anchor consisted of two 2-foot lengths of 3-inch polyvinyl chloride (PVC) pipe filled with concrete and joined in a parallel position with steel rebar. The PE waterline pipe was wrapped with protective rubber at locations where the anchors were attached with stainless steel bands. Buoys were temporarily tied to the line to keep it afloat. The waterline was pushed into the lake as it was fabricated. While the lake maintenance staff was joining and anchoring the waterline, a trench for the line was dug in shallow water near each bank by the Corps workboat ROS.

When the total length of waterline was fused together and floated out into the lake, it was moved into position by Corps patrol boats and connected to the water supply on the bank. Contract divers inspected the trenches at the shoreline and guided the line into position on the lake bottom as the line was filled with water and buoys were cut loose. Sinking the line into position proceeded across the lake to Deerlick Creek Park. Bags of concrete mix were placed on the line by divers at thrust points. Covering of shoreline trenches by the workboat ROS completed the job.

Water valves were opened and water was delivered at the rate of 120 gpm to Deerlick Creek Park. The line was pressure tested and opened to its working pressure of 170 psi with no leaks detected. Total cost of the project, including engineering, labor, and materials, was below \$50,000, quite a savings to the government over the alternatives.



Early planning stage – native fern/wildflowers – Okatibbee Lake, Miss.

## Landscaping with Native Plants — A Success Story at Okatibbee Lake

*Roy Van McWhorter  
Park Ranger  
Okatibbee Lake*

Yes, natural landscaping is in again and many backyard gardeners are now planting gardens that feature the native plants of their region in attractive ornamental beds and in re-created natural environments. So, in fall 1988, the Resource Management staff at Okatibbee Lake decided to undertake a large-scale native plant landscaping project throughout the public-use areas and along exposed mud flats in the lake.

Our first step was to take out an assortment of project maps and start making notes on where we wanted to place selected native plants. Our primary objective during this first phase of our landscape analysis was to select local shrubs and trees for spring and summer flowers and fall foliage that could be easily transplanted or purchased at local nurseries. This was also the time that we had to take a serious look at the soil's texture, degree of compaction, depth

of the topsoil, moisture content, and drainage. We also made notes on the existing vegetation and its condition in each of the selected planting areas. Last of all, nursery stock had to be ordered during November and December 1988.

With a rough version of our site plan and planting plan in our hands, it was time to head to the woods for our native plants. Heavy-duty shovels, good pruning shears, and a good strong back were a must. We began transplanting in December 1988. December through February are the dormant months and make the best season for transplanting. There is less stress on the plant during this time, but it is still a good idea to prune out the bottom one-third of any transplanted flowering dogwood, southern magnolia, wild azalea, or red maple.

During our first phase, we transplanted 45 flowering dogwoods, 8 southern magnolias, 6 red

maples, 3 American hollies, 4 wild azaleas, and 20 native wild roses. As of July, the majority of these plants had taken to their transplanted site. Survival rates varied from 95 percent for the wild roses to 50 percent for the southern magnolias. Flowering dogwoods have done extremely well also, mainly due to the fact that they adapt to diverse habitats, ranging from open, partially shaded, and shaded areas.

We might also add that all new plantings need adequate water during this first season of growth, and if time permits mulch the plantings with leaf litter or pine straw to protect them from extremes of heat, cold, and drought.

Then in late January and early February our nursery stock began arriving and we were into the second phase of our planting plan. With some 500 bald cypress, 200 cherryback oak, 50 eastern redbud, and 8 silver maple trees, we were prepared for serious natural landscaping.

Bald cypress seedlings, one of our more common water-loving plants, were planted on exposed mud flats at several locations around the lake. Some 200 bald cypress trees were planted along drainage ditches along the main roadway in Twiltley Branch Campground.

Cherrybark oaks were also planted in large numbers. Oaks were planted along a 1-mile stretch of the Tailrace Road. Some of the oaks were used as border plants around several wildlife food plots.

The eastern redbud would fall just behind the flowering dogwood as our area's most attractive springtime flowering tree. The showy reddish flowers actually appear before the leaves. Like the flowering dogwood, it is highly adaptable to open, partially shaded, and shaded areas. In order to share the glory of this attractive flowering tree, we chose to plant

several in five of our public-use areas. Survival rate has been almost 100 percent. It might also be noted that the redbud offers attractive fall foliage.

Last of all, we chose to selectively place 8 silver maples in large open areas to serve a multi-purpose role, ranging from producing shade as it matures to some 100 feet in height and providing attractive early spring flowers and fall foliage ranging from yellow-gold to dark maroon depending on the trace elements in the soil.

Since our maples were choice nursery stock ranging from 4 to 6 feet in height, project staff anchored each plant in place with two wood stakes and strips of old inner tube. This type of support prevents the wind from whipping the young plant about and moving the root ball. The two-stake support system will also reduce the likelihood of any rubbing injury and uneven trunk development.

Following the placement of all of our large-scale plantings, a question arose concerning the placement of a flower bed in Twiltley Branch Campground. We thought it would truly be a challenge to plant a native fern and wildflower garden. In March we transplanted over fifty native ferns and wildflowers bearing such fern names as Christmas, royal, lady, cinnamon, ebony spleenwort, bracken, broad beech, and rattlesnake along with such wildflower names as wood violet, spiderwort, mayapple, blue-eyed grass, and narrow-leave sunflower. With some hands-on manicuring, the native plant garden has done extremely well.

We realize that our success rate with various plants will vary, but we are anxious to continue learning the fine art of landscape architecture. This will be an annual program at Okatibbee Lake, and the project staff continues to look forward to beautifying the project grounds.

**Black-eyed susan — an attractive later summer and fall wildflower, excellent for roadside landscaping — Okatibbee Lake**



# HQUSACE Natural Resources Management Perspective

## Historic Times

After missing several issues, I want to renew this column as a means to get the word out on what's happening in the Natural Resources Management program.

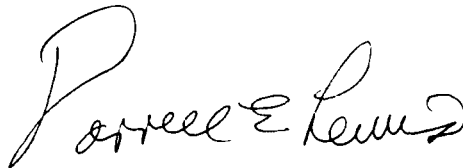
In my personal opinion, we've never been faced with more opportune times — hence the title "Historic Times." I'd like to use this column to discuss some of the more significant issues we face.

***Corps of Engineers Recreation Study*** — For a number of years, there has been debate over the extent of the Corps' role in recreation. Now something is being done to resolve this issue. The Corps is conducting a year-long study of the recreation program to "develop a plan to maintain and enhance the public recreational opportunities at Corps water resource projects while reducing Federal expenditures for recreation." This study is well underway with Dave Wahus from this branch serving as Executive Director. The study is designed to be an unbiased effort, incorporating the viewpoints of a diverse group of people (for example, professionals, other agency leaders, user groups, and private sector developers). Numerous Corps Task Forces have developed specific reports, a consultant firm has been conducting telephone interviews, and regional public workshops are scheduled for March and April of this year. The study will result in a report that will be transmitted to Congress in Fall 1990. My expectation is that after all is said and done, we will have a concise policy on recreation on Corps lakes. From that, it is my intent to develop clear guidance so that we can get on with our mission. I am extremely optimistic about the ultimate result of this effort and look forward to the results of this dialogue between the Executive and Legislative branches.

***Environmental Policy*** — There can be no doubt that concern for the environment from the President's office on down is on the rise. Last November the Secretary of Defense stated that he wants "the Department of Defense to be the Federal leader in agency environmental compliance and protection." This message is echoed in a Chief's Memorandum on "Strategic Direction for Environmental Engineering," dated 14 February 1990. We are already seeing evidence of this increased emphasis on environmental matters in our ongoing effort with the US Fish and Wildlife Service to implement the North American Waterfowl Management Plan. We're committed, through a cooperative agreement with the Fish and Wildlife Service, to identifying the role that Corps lands and waters currently play in providing waterfowl habitat in critical flyways as well as opportunities to improve waterfowl habitat. You will be seeing greater emphasis on managing wetlands as the President's "No Net Loss of Wetlands" goal is transformed into National policy.

***“Future Horizons in Natural Resources Management”*** — This was the theme of the National Conference held 5–9 February 1990 in Nashville, Tennessee. Over 170 Corps employees attended the conference. The conference introduced the many activities that affect the Natural Resources Management (NRM) program and provided a forum for discussion to identify their significance. In addition to a variety of issue-related presentations, attendees heard from Department of Army leadership and representatives of our sister land management and environmental agencies. There were numerous workshops dealing with future directions of the Corps Natural Resources Management Program. As a follow-up, Division and HQUSACE representatives met to identify significant program issues and prioritize their relative importance. These issues are currently under review and will be made available in a later column.

***Career Development*** — On an internal note, a Career Development Committee made up of representatives from every Division has been hard at work identifying issues and priorities in the Natural Resources Management career field. You should have received a comprehensive questionnaire several months ago. The results of this survey will help the committee focus on the issues you identified as critical.

A handwritten signature in black ink, reading "Darrell E. Lewis". The signature is fluid and cursive, with a large initial "D" and a stylized "L" at the end.

DARRELL E. LEWIS  
Chief, Natural Resources  
Management Branch, HQUSACE

# **A Call to ARMS**

***N. Theresa T. Hoagland  
US Army Engineer Division, Ohio River***

The American River Management Society (ARMS) is a new organization established to further professional river management through information exchange. ARMS provides a forum for river resource managers, researchers, and interested individuals with river stewardship responsibilities to exchange information and review procedures concerning appropriate use and management of river resources. The Society is represented by an Eastern and Western Region, each of which functions as a separate organization governed by its own bylaws.

The ARMS Eastern Region was formed as a nonprofit organization by the joint efforts of Federal, State, and local agencies and the private sector. Charter members of the ARMS Eastern Region include representatives from the US Forest Service, National Park Service, US Army Corps of Engineers, Indiana Department of Natural Resources, Ohio Department of Natural Resources, and National Association of Canoe Liveries and Outfitters. The ARMS Eastern Region will take a holistic approach to river management, and a membership is sought that represents a broad spectrum of expertise and interests. The participation of other organizations involved in river management issues is welcomed. The Eastern Region is currently divided into three chapters: Lake States, Northeast, and Southeast.

Eastern Region members will receive a quarterly newsletter, membership directory, and a directory of related organizations. An annual membership meeting will be sponsored, at which time new officers will be elected and speakers and workshops will be presented. The society may also issue scholarly and informational publications, hold chapter meetings and workshops, provide assistance to research, and aid in the development of professional recommendations concerning river resources. Eastern Region membership dues are \$15 per year (regular) and \$10 per year (associate). For additional information about the ARMS Eastern Region, contact the author at the US Army Engineer Division, Ohio River, ATTN: CEORD-CO-OR, PO Box 1159, Cincinnati, OH 45201-1159, or call (513) 684-3191. Membership applications may be obtained from the author.

A directory of other organizations associated with river resources is being compiled. If you are aware of any, please submit the name, address, and phone number of a point of contact to Tom Kidd, Indiana Department of Natural Resources, Division of Outdoor Recreation, 605 State Office Building, Indianapolis, IN 46204. Tom should also be contacted by anyone interested in contributing an article to the Eastern Region newsletter.

## **Human Lyme Disease Vaccine Research**

In early 1990, research into the human application of an animal vaccine for Lyme disease could begin, possibly producing a human Lyme disease vaccine in five years. Lyme disease, which is spread by ticks found on deer, mice, and other mammals, has been reported in 14,000 cases in the United States, about 5,000 of which occurred in 1988. Most cases are confined to the Northeast, Wisconsin, and Minnesota.

The present vaccine, developed in 1986, protects hamsters against infection with Lyme disease. A vaccine to protect dogs should be ready for use within a year. In 1986, Russell Johnson, a microbiologist at the University of Minnesota in Minneapolis, and colleagues showed that injecting killed Lyme disease bacteria into hamsters would protect them against infection.

Researchers at the University of Wisconsin used a different technique in their work. Antibodies against Lyme disease bacteria were produced by first injecting the bacteria into a group of hamsters. Antibodies were then extracted and used to protect another group of hamsters, which had been irradiated so that they lost their normal immune systems and would show symptoms of Lyme disease when infected. Later, they showed no sign of the disease.

Johnson's vaccine has been patented by the University of Minnesota and its use licensed to Molecular Genetics of Minneapolis. Research into a human version of the vaccine will begin when negotiations are concluded between Molecular Genetics and a maker of human vaccines.

# Corps at Rough River Lake Wins Award

The US Army Corps of Engineers at Rough River Lake in the Nashville District has won its fourth national award since 1983 for its Annual Lakeshore Clean-up. The award was presented by the Keep America Beautiful Campaign in December at Washington's Marriott Hotel.

Twice earlier the Keep America Beautiful Campaign has given awards to the project. Another award was given by the Take Pride in America Campaign through the Department of Interior.

The most recent award was the Distinguished Service Award in the State/Federal Agency category of the 1989 Keep America Beautiful, Inc., National Awards Program. Roger Powers, president of the Keep America Beautiful Campaign cited successful public/private partnerships, citizen actions, and public education as the major reasons the Corps at Rough River Lake was selected for the award.



## NATURAL RESOURCES RESEARCH PROGRAM

This bulletin is published in accordance with AR 310-2. It has been prepared and distributed as one of the information dissemination functions of the Environmental Laboratory of the Waterways Experiment Station. It is primarily intended to be a forum whereby information pertaining to and resulting from the Corps of Engineers' nationwide Natural Resources Research Program can be rapidly and widely disseminated to OCE and Division, District, and project offices as well as to other Federal agencies concerned with outdoor recreation. Local reproduction is authorized to satisfy additional requirements. Contributions of notes, news, reviews, or any other types of information are solicited from all sources and will be considered for publication so long as they are relevant to the theme of the Natural Resources Research Program, i.e., to improve the effectiveness and efficiency of the Corps in managing the natural resources while providing recreation opportunities at its water resources development projects. This bulletin will be issued on an irregular basis as dictated by the quantity and importance of information to be disseminated. The contents of this bulletin are not to be used for advertising, publication, or promotional purposes. Citation of trade names does not constitute an official endorsement or approval of the use of such commercial products. Communications are welcomed and should be addressed to the Environmental Laboratory, ATTN: J. L. Decell, U.S. Army Engineer Waterways Experiment Station, (CEWES-EP-L), 3909 Halls Ferry Road, Vicksburg, MS 39180-6199, or call AC (601) 634-3494.

LARRY B. FULTON  
Colonel, Corps of Engineers  
Commander and Director

CEWES-EP-L

OFFICIAL BUSINESS

DEPARTMENT OF THE ARMY  
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS  
3909 HALLS FERRY ROAD  
VICKSBURG, MISSISSIPPI 39180-6199

BULK RATE  
U.S. POSTAGE PAID  
Vicksburg, MS  
Permit No. 85